

UNISYS

**CTOS[®]
BMULTI Agent
Operations
Guide**

Release 10.1

Priced Item

**April 1991
Distribution Code SA
Printed in U S America
4163 4932-000**

UNISYS

CTOS[®]
BMULTI Agent
Operations
Guide

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Glossary-1 through 5	Original
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Index-1 through 3	Original
Index-4	Blank

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About This Guide

The CTOS® BMULTI Agent serves as an asynchronous message-level interface between the BTOS™ Message Control System (MCS) and the CTOS BMULTI gateway. In this guide the term *gateway* refers to the protocol conversion operation performed by the BMULTI gateway. The interface between the BMULTI Agent and the BMULTI gateway allows you to write application programs under the MCS without having a detailed knowledge of the poll/select protocol requirements. The BMULTI Agent Configurator allows you to define general configuration parameters and to create station definitions.

Purpose

This guide contains information to help you to operate the BMULTI Agent.

Scope

This guide describes installing, configuring, and operating the BMULTI Agent Configurator and BMULTI Agent.

Audience

This guide is for system administrators who want to configure a poll/select protocol network using BTOS MCS, CTOS BMULTI Agent, and the CTOS BMULTI gateway. This guide is also for Unisys personnel supporting such systems.

Prerequisites

To use this guide, you should know basic data communication concepts. You should also be familiar with CTOS, MCS, and BMULTI operations.

How to Use This Guide

Use this guide to configure and implement the BMULTI Agent environment.

Organization

This guide consists of five sections and two appendixes:

Section 1. Overview

This section describes the BMULTI Agent, the hardware and software requirements, and new features. It also defines the agent's role within the MCS network, describes how the agent transfers data to and from the host, and identifies the network control commands that the agent accepts.

Section 2. Software Installation

This section provides information about the installation the BMULTI Agent software onto the hard disk of your CTOS workstation or shared resource processor. For specific instructions to install the BMULTI Agent software, refer to the *CTOS BMULTI Operations and Programming Guide*. The choice to install the BMULTI Agent is an option during the installation of the BMULTI software product.

Section 3. Using the BMULTI Agent Configurator

This section provides general information on how to operate the BMULTI Agent Configurator, explaining the main menu and screen selections, command and function keys, parameter definitions, and the use of the worksheet.

Section 4. Modifying the BMULTI Agent Configuration

This section explains how to create or modify a BMULTI Agent configuration file using the default configuration file or by creating a new one. It also describes how to add, delete, or display station information.

Section 5. Installing the BMULTI Agent

This section explains how to install the BMULTI Agent on a CTOS workstation, IDS or enhanced IDS module, or shared resource processor.

Appendix A. System Messages and Status Codes

This section lists the error messages you may encounter when configuring or executing the BMULTI Agent.

Appendix B. Worksheet

This section provides a worksheet that lists all configuration parameters. You may photocopy and use this worksheet to plan and record your entries.

A glossary and index are also included.

Related Product Information

You may find the following documents helpful in performing the tasks described in this guide. These documents (or their replacements) are published by Unisys Corporation and can be ordered through Corporate Software and Publication Operations.

Product Documentation

In addition to the *CTOS BMULTI Agent Operations Guide*, the following printed product information is packaged with release 10.1 of this product:

CTOS BMULTI Operations and Programming Guide (Release 10.1)

CTOS BMULTI/X.25 Operations Guide (Release 1.1)

CTOS Printer Pass-Through (PPT) Operations Guide (Release 2.2)

CTOS Documentation

CTOS programmers and operators who want details on CTOS, CTOS procedural interfaces, Standard Software commands, Executive features, and status codes may find the following manuals useful:

BTOS II Standard Software Operations Guide

BTOS II System Reference Manual, 2 vols.

BTOS II System Procedural Interface Reference Manual, 2 vols.

BTOS II System Status Codes Reference Manual

CTOS Executive User's Guide

CTOS Executive Reference

CTOS Status Codes Reference Manual

Notation Conventions

This guide uses the following typographical conventions:

Words that you are to type and that appear on the screen are shown in *italic*.

Parameter names are shown in **bold**.

Keys are shown in uppercase letters, for example, press the GO key.

When two keys are to be used together for an operation, they are hyphenated. For example, SHIFT-RETURN means that while you hold down the SHIFT key, you press the RETURN key.

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Section 1

Overview

The BMULTI Agent serves as a bridge between the Message Control System (MCS) and the CTOS BMULTI gateway. The agent allows MCS applications running on a CTOS system to communicate with a host using the BMULTI poll/select multipoint protocol.

The BMULTI Agent product consists of two components: the BMULTI Agent Configurator and the BMULTI Agent itself. The configurator is a menu-driven interactive utility used to define a configuration file. The agent reads the information from the configuration file created by the configurator to establish a specific MCS operating environment. Once installed, the agent acts as a system service that is transparent to the user.

To use the BMULTI Agent product, perform the following procedures:

1. Install the MCS, the BMULTI gateway, and the BMULTI Agent software onto a CTOS workstation or shared resource processor.
2. Create the BMULTI Agent configuration file through the BMULTI Agent Configurator.
3. Install the MCS system service.
4. Install the BMULTI gateway system service.
5. Install the BMULTI Agent system service.

The agent is included in the BMULTI software package; refer to the *CTOS BMULTI Operations and Programming Guide* for information on software and hardware requirements and on how to copy the BMULTI Agent and gateway software to your CTOS system. See Sections 2 through 5 of this guide for detailed instructions for copying or creating the configuration file, and installing the agent. For information on the MCS, refer to the *BTOS Message Control System (MCS) Installation and Operations Guide*.

Figure 1-1 shows the system services modules that must be installed to run concurrently with the BMULTI Agent. The Communications Organizer and Message Control Module are components of the MCS.

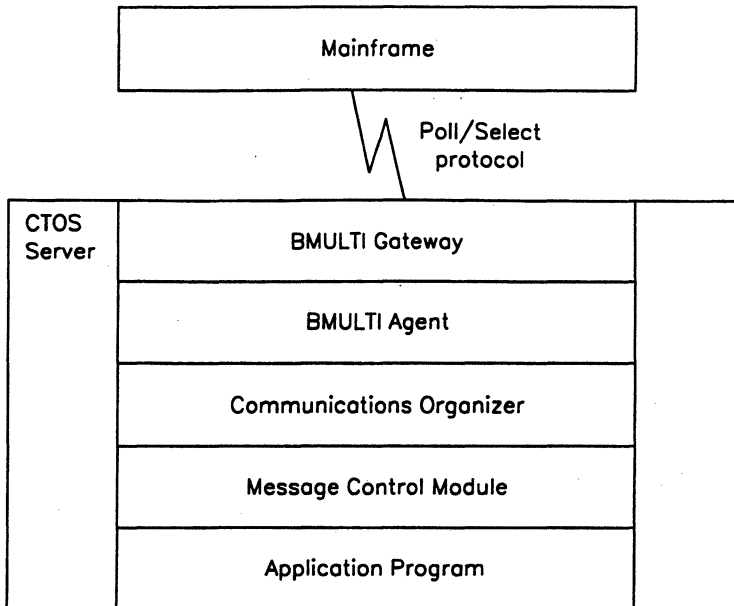


Figure 1-1. Components Required to Use BMULTI Agent

The BMULTI Communications Service

The CTOS BMULTI communication service allows a CTOS workstation or shared resource processor to communicate with a Unisys A-Series or V-Series host running a poll/select protocol. The host sees the CTOS system running BMULTI as a standard poll/select device. See the *CTOS BMULTI Operations and Programming Guide* for additional information about BMULTI.

Message Control System (MCS)

The Operator Interface module is a component of the MCS that can help you monitor the status of your network. Using the Operator Interface module, you can send messages and network control commands within the BMULTI environment.

BMULTI Agent

The BMULTI Agent is an asynchronous message-level interface between the MCS and CTOS BMULTI gateway. The agent provides the BMULTI gateway with multiple-message paths to the host through multiple-device addresses. This allows you to write application programs under MCS without having detailed knowledge of poll/select protocol restrictions.

One copy of the BMULTI Agent supports 32 stations. If your proposed configuration requires more than 32, you will need to install multiple instances of the BMULTI Agent under the Multiple Gateways Service (MGS).

The BMULTI Agent controls the following functions:

- Initiates, monitors, and terminates network communication sessions
- Transfers data from the MCS to the BMULTI gateway
- Initiates and coordinates error-recovery procedures
- Reports network errors to the MCS

New Features

This release of the BMULTI Agent includes two new installation parameters for the system service. The optional parameter, [**Detach on Tx Error (Default = Y)**], specifies that if there is a transmission error associated with the BMULTI gateway, the Logical Station connection will be detached. The alternate selection specifies that the connection will be maintained, even if there is a transmit error.

The next optional parameter, **[Tx Timeout in Secs (Default = 120)]**, defines the maximum time that can elapse when waiting to transmit. The value can be any integer value from 0 to 65536, with 0 denoting no timeout value.

The default values of both of these parameters enable the BMULTI Agent behavior to be consistent with previous releases of the agent.

Data Communications Processor

The MCS sees the agent as a Data Communications Processor (DCP). The agent provides multiple-message paths using the concept of stations. The agent maintains a one-to-one correspondence between the stations defined in the MCS environment and BMULTI gateway device addresses.

The BMULTI Agent can run concurrently with other agents and Interactive Table Processor (ITP) generated data communication processors in the MCS environment. See the *BTOS Poll/Select Terminal Interface (PSTI) Implementation and Operations Guide* for additional information.

DCP numbers three to six are valid for agents. A maximum of two copies of any agent can be installed in the MCS environment. The DCP number you assign to the copy of the agent must not be assigned to any other DCP running concurrently in the MCS environment.

See the *BTOS Message Control System (MCS) Programming Reference Manual* for additional information concerning data communication processors.

Available Network Control Commands

An application program or the operator can issue the following commands through the MCS Operator Interface (OI) module:

Command	Action
ATTACH	Attaches an application to a BMULTI station to enable the application to send or receive messages.
DETACH	Disconnects an application from a BMULTI station.
STATION NOT READY	Terminates data communication with BMULTI station by placing the station in a NOT READY state. The station must be placed in a READY state to begin communication.
STATION READY	Makes the station available for communication by placing the station in a READY state.
LINE NOT READY	Terminates communication with all BMULTI stations on the specified communication line.
LINE READY	Establishes communication with all BMULTI stations on the specified communication line.

BMULTI Agent Message Handling

The following steps outline the data flow within the network and describe the role of the BMULTI Agent:

1. Application sends an ATTACH request to the Message Control Module (MCM).
2. MCM verifies that a station is ready and acknowledges the ATTACH request.
3. Application sends the host-bound messages that are routed by the MCM to the BMULTI Agent.
4. BMULTI Agent removes the DCP header.
5. BMULTI Agent sends the host-bound messages to the BMULTI gateway.
6. BMULTI gateway passes the host bound to the host running poll/select multipoint protocol.

7. Host processes the messages and passes the application-bound messages back to BMULTI gateway.
8. BMULTI gateway sends the application-bound messages to the BMULTI Agent.
9. BMULTI Agent appends a DCP header.
10. BMULTI Agent sends the application-bound messages to the MCM that routes the messages back to the application.
11. Application sends a DETACH request.
12. MCM verifies that the station is still attached and acknowledges the DETACH request.

Tasks and Commands

Use the following table to locate tasks you will perform using the BMULTI Agent, associated commands, and where you can turn in this guide for more information. The commands listed below are not a complete list of all the commands associated with a particular task, but rather representative examples.

Task	Command	Section
Determine the system requirements for using BMULTI Agent and copy the agent softwas to your hard disk	Software Installation or Installation Manager	2
Learn how to use the BMULTI Agent Configurator	BMULTI Agent Configurator	3
Use the BMULTI Agent Configurator to create or modify a BMULTI Agent configuration file	BMULTI Agent Configurator	4
Install the BMULTI Agent as a system service	Install BMULTI Agent	5

Section 2

Software Installation

This section provides information about the installation the BMULTI Agent software onto the hard disk of your CTOS workstation or shared resource processor. For specific instructions to install the BMULTI Agent software, refer to the *CTOS BMULTI Operations and Programming Guide*. The choice to install the BMULTI Agent is an option during the installation of the BMULTI software product.

To install the BMULTI Agent, perform the *Software Installation* command for the BMULTI gateway, selecting the option to install the Agent software.

BMULTI Agent Environment

Hardware Requirements

The BMULTI Agent operates on a CTOS workstation, a shared resource processor, or an IDS or enhanced IDS module attached to a CTOS workstation. For specific hardware requirements and options, refer to the *CTOS BMULTI Operations and Programming Guide*.

Software Requirements

In addition to sharing the same software requirements as the BMULTI gateway, the BMULTI Agent also requires the BTOS Message Control System (MCS) 4.0 or higher. For other specific application software and operating system requirements, refer to the *CTOS BMULTI Operations and Programming Guide*.

The BMULTI Agent system service must be installed on the same processor as the BMULTI gateway; this can be on a shared resource processor, or on a server or client workstation. However, although the BMULTI gateway and Agent can be installed on a client workstation, because part of the MCS software operates on the server, there may be some performance degradation.

The BMULTI Agent Software

The following files are copied onto the hard disk:

<Sys>BmAgentMsgFile.bin

The BMULTI Agent message file.

<Sys>BmultiAgent.Run

Activates the agent for use in BMULTI data communications in an MCS environment.

<Sys>BmultiAgentConfig.Run

Activates the BMULTI Agent Configurator, a utility used to establish the configuration parameters for the network.

<Sys>BmultiForm.Lib

Contains the forms for the screen displayed by the configurator.

The following new commands are now available on your system:

BMULTI Agent Configurator

Executes the BMULTI Agent Configurator.

Install BMULTI Agent

Installs the BMULTI Agent as a system service. However, before installing the system service, you must first configure the agent. Refer to Sections 3 and 4 for more information.

Section 3

Using the BMULTI Agent Configurator

This section provides general information on how to operate the BMULTI Agent Configurator. The section explains the main menu and screen selections, command and function keys, parameter definitions, and use of the worksheet.

See Section 4, "Modifying the BMULTI Agent Configuration," for the steps you follow to define the BMULTI Agent configuration.

The BMULTI Agent Configurator

The BMULTI Agent Configurator is a menu-driven utility that allows you to define or modify the configuration file that contains the specific configuration parameters needed by your operating environment. These parameters are DCP number, line number, LSN range, station names, device addresses, and network control characters.

This configuration file must be modified for your environment before installing the BMULTI Agent. The BMULTI Agent uses this file as input to establish the operating environment.

The BMULTI Agent configuration file can be modified while the BMULTI Agent is executing. However, the new configuration will *not*, however, be in effect until the next time the agent is installed.

The default name is `[!Sys]<Sys>BmultiAgentConfig.Sys`. You can use this file or create a new configuration file. See Section 4 for instructions.

Executing the Configurator

Use the following procedure to execute the BMULTI Agent Configurator on a CTOS system:

1. At the Command line, type *BMULTI Agent Configurator*. and press the RETURN key.
2. For the **Configuration File Name** parameter, type the file name. The default file name is:

[!Sys]<Sys>BmultiAgentConfig.Sys

To create your own BMULTI configuration file or modify an existing file, type the name of the file.

Note: *If you are installing the BMULTI Agent through the JCL command, this paramter must be entered in the JCL file. See Section 5, "Installing the BMULTI Agent."*

4. Press the GO key.
5. Perform the desired configuration procedures.
6. Press the FINISH key to exit the BMULTI Agent Configurator and return to the Executive Command line.

Note: *When you press the FINISH key at any point in the procedure, the open file is saved and a message prompts you to press the GO key to confirm the exit from the configurator, or the CANCEL key to cancel the FINISH command.*

To exit without saving the open file, press ACTION-FINISH. However, if you pressed the FINISH key at any time when you were working on the file, the file was saved at that time. To help avoid mistakes, you should always make back-up copies of all configuration files.

Exiting the Configurator

Exit the configurator by pressing the FINISH key. The open configuration file is automatically saved. The configurator then prompts "Press GO to exit. Press CANCEL to cancel."

To exit without saving the open configuration file, you must press ACTION-FINISH. This aborts all changes since the last save and exits the configurator.

Main Menu

The Main Menu, shown in Figure 3–1, appears whenever you execute the BMULTI Agent Configurator.

At the top of the screen the Main Menu displays the name of the BMULTI Agent Configuration file that you are creating or modifying. All information you add or modify on the secondary screens is included in this file.

At the bottom of all of the configurator screens is a horizontal row of 10 shaded blocks that represent the function keys. The functions available on each screen are displayed in these blocks. Press the function key that corresponds to the desired activity or screen. See "Using the Function Keys" in this section for a detailed description of the function keys and their use.

The diagram illustrates the Main Menu screen of the BMULTI Agent Configurator. The screen is enclosed in a rectangular border. At the top, a label reads "BMULTI AGENT CONFIGURATOR". Below this, the title "MAIN MENU" is centered. The main area contains a "File Name:" label followed by a text input field. Below the input field, two function key options are listed: "F1 - General Information" and "F2 - Station Selection". At the bottom of the screen, there is a horizontal row of 10 shaded blocks representing function keys. The first two blocks are labeled "GENE" and "SECT", while the remaining eight blocks are empty.

Figure 3–1. Main Menu

The General Information screen, shown in Figure 3-2, allows you to define the DCP number, the line number, and the lower and upper limits of the LSN numbers. These values are used to provide configuration information about the agent.

BMULTI AGENT CONFIGURATOR

GENERAL INFORMATION

DCP Number (3-6)

Line Number (1-8)

Logical Station Number (LSN)

Lower Limit (1-140)

Upper Limit (1-140)

Figure 3–2. General Information Screen

The Station Selection screen, shown in Figure 3–3, shows the station names already defined in the configuration file. If you choose to add or modify station information, the Station Definition screen is shown. If you choose to delete a station name, the configurator prompts you to confirm the deletion and then redisplay the Station Selection screen.

The diagram illustrates the 'STATION SELECTION' screen within the 'BMULTI AGENT CONFIGURATOR'. The screen is divided into three main sections:

- Title Bar:** Labeled 'BMULTI AGENT CONFIGURATOR'.
- Main Content Area:**
 - Section Header:** 'STATION SELECTION'.
 - Sub-section Header:** 'Defined Station Names'.
 - Data Grid:** A table with 4 columns and 8 rows of empty rectangular input fields for station names.
- Control Bar:** Located at the bottom, it contains a row of buttons: 'ADD', 'MODIFY', 'DELETE', followed by four empty square buttons, and finally a 'HOME' button.

Figure 3–3. Station Selection Screen

The Station Definition screen, shown in Figure 3–4, allows you to add, modify, and save station information such as the station name, device address, ServiceID, and network control character.

The diagram shows a graphical user interface window titled "BMULTI AGENT CONFIGURATOR". Inside the window is a sub-window titled "STATION DEFINITION". This sub-window contains four labeled input fields: "Station Name" (a long horizontal box), "Device Address" (a short horizontal box), "Service ID" (a long horizontal box), and "Network Control Character" (a short horizontal box). Below the "STATION DEFINITION" sub-window is a row of controls. From left to right, it includes an empty box, a button labeled "SELECT", another empty box, three more empty boxes, a button labeled "SAVE", another empty box, and a button labeled "HOME".

Figure 3–4. Station Definition Screen

Saving Information

After you enter all the information in the fields of the General Information or Station Definition screens, you can save it by pressing the SAVE key (F8) before you exit the screen. Otherwise, the information is saved when you press the FINISH key to exit the configurator.

If you make a mistake and wish to exit the configurator *without* saving changes, press ACTION–FINISH.

If you entered Service IDs for some station addresses, but not all of them, the configurator beeps and warns you of the inconsistency. The prompt is *WARNING: ServiceID mismatch in station: StationName*, where

StationName is the first station that has an inconsistent Service ID. In a configuration file, if you assign a Service ID to one station address, you must assign unique Service IDs to all the other addresses as well.

Using the Command Keys

Use the following command keys to operate the BMULTI Agent Configurator.

Command Key	Description
ACTION-FINISH	Aborts the configurator and exits, discarding any changes that have been made since activating the configurator or since the last time the file was saved.
BACKSPACE	Moves the cursor one space to the left, deleting the character displayed in the space.
CANCEL	Cancels deletion of station information. Cancels the FINISH command and continues to display the current screen. Cancels an error condition. Removes the error message and allows you to continue operations.
CODE-DELETE	Deletes a field on a secondary screen so that you can enter a new value.
DELETE	Deletes a character on a secondary screen so that you can enter a new value.
DOWN ARROW	Moves the cursor to the next field on a secondary screen.
FINISH	Saves the configuration file and displays the confirmation message <i>Press GO to Exit. Press CANCEL to cancel.</i> If you press the GO key, you exit the configurator. If you press the CANCEL key, you remain on the current screen.
GO	Confirms the deletion of general or station information. Confirms exiting the configurator after you press the FINISH key.
NEXT	Moves the cursor to the next field on a secondary screen.
OVERTYPE	Allows you to enter a new value in a field over an old value.
RETURN	Moves the cursor to the next field on a secondary screen.
TAB	Moves the cursor to the next field on a secondary screen.

Using the Function Keys

A horizontal row of 10 shaded blocks is displayed at the bottom of each screen of the BMULTI Agent Configurator. These blocks represent the function keys, F1 through F10, at the top of the keyboard.

When a key is active for a screen, a mnemonic explaining the use of the key is displayed within the block at the bottom of the screen. When a key is *not* active for a screen, the block on the screen representing that key is blank.

Because the use of the function keys varies from screen to screen, the valid function keys and their actions are described in the four separate tables that follow. Each table corresponds to a specific screen.

Main Menu Function Keys

Function Key	Description
F1 (GENERL)	Displays the General Information screen.
F2 (SELECT)	Displays the Station Selection screen.

General Information Screen Function Keys

Function Key	Description
F8 (SAVE)	Saves the information entered on the screen. You cannot save the information until you enter values in all the fields.
F10 (HOME)	Displays the Main Menu.

Station Selection Screen Function Keys

Function Key	Description
F1 (ADD)	Displays the Station Definition screen, allowing you to define the parameters of the new station in the highlighted field.
F2 (MODIFY)	Displays the Station Definition screen, allowing you to modify the parameters of the station highlighted in the displayed list of station names. This key does not function (and no menu label is displayed) if there are no currently defined stations.
F3 (DELETE)	Prompts you to confirm the deletion of the highlighted station by pressing the GO key or cancel the deletion by pressing any other key. This key does not function (and no menu label is displayed) if there are no currently defined stations.
F10 (HOME)	Displays the Main Menu.

Station Definition Screen Function Keys

Function Key	Description
F2 (SELECT)	Displays the Station Selection screen.
F8 (SAVE)	Saves the information entered on the screen. You cannot save the information until you have entered values for all the required fields.
F10 (HOME)	Displays the Main Menu.

General Information Screen Parameters

Note: Before you use the BMULTI Agent Configurator to create or modify a configuration file, read the following parameter descriptions carefully. You will need this information to determine the values to enter in the fields of the your BMULTI Configurator file.

Parameter	Description
DCP Number	Required field. A number between three and six that identifies the BMULTI Agent as a data communication processor in the MCS environment. This DCP number must be different from the DCP numbers used for other data communication processors that run concurrently in the MCS environment.
Line Number	Required field. A number between one and eight that uniquely defines the line from the server processor to the host. This line number must be different from the line numbers used for other lines that run concurrently in the MCS environment.
LSN – Lower Limit	Required field. The lower limit of the range of LSNs that can be assigned to the BMULTI stations in the BMULTI Agent Configuration file. Values are 1 to 140.
LSN – Upper Limit	Required field. The upper limit of the range of LSNs that can be assigned to the BMULTI station in the BMULTI Agent Configuration file. Values are 1 to 140. The difference between the lower and upper limit of LSNs plus one must be equal to or greater than the number of BMULTI stations defined in this BMULTI Agent Configuration file. $(\text{Upper Limit} - \text{Lower Limit}) + 1 = \text{Number of Stations Defined}$ <i>Example:</i> If you define 15 BMULTI stations, the difference between the lower limit of the LSNs and upper limit of the LSNs must be equal to or greater than 14. You cannot assign a range of LSNs that includes LSNs that were previously assigned to stations in other configuration files.

Station Definition Screen Parameters

Parameter	Description
Station Name	Required field. The unique name of this station. The first character of the station name must be alphabetic and the remaining characters must be alphanumeric. The station name can be a maximum of 17 characters. The station name cannot contain a blank character. This station name must be different from other station names that run concurrently in the MCS environment.
Device Address	Required field. A unique two non-blank character value defining the device address.
Service ID	Optional field. A unique name of up to twelve characters, enclosed in angle brackets, defining the Service ID of an instance of the BMULTI gateway system service running under MGS.
Network Control Character	Optional field. A hexadecimal value, which should not be any of the data communication control characters.

Using the Worksheet

The worksheet has two purposes: You should use it to plan how you want to configure the BMULTI Agent and to keep a record of your final entries. A sample worksheet is in Appendix B of this guide; you may make photocopies of the worksheet for your use.

Before entering any information on the worksheet, carefully read the descriptions of the parameters listed for the General Information screen and the Station Definition screen. Your configuration scheme must fit within the parameters of the BMULTI Agent.

For example, one copy of the BMULTI Agent supports 32 stations. If your proposed configuration requires more than 32, you will need to install multiple instances of the BMULTI Agent under the Multiple Gateways Service (MGS).

As you are planning how to use the BMULTI Configurator, you should review the MCS environment. Remember that the BMULTI Agent reads the configuration file you create using the configurator to define the agent's operations within the network.

You must also make sure that your configuration parameters are unique. Verify that the DCP number, line number, LSN ranges, Service IDs, and station names you plan to use for the BMULTI Agent have not been assigned in other data communication processors operating in the MCS environment. To eliminate possible duplicate numbers, write each station name and device value on the worksheet before entering the information in the configuration file.

Section 4

Modifying the BMULTI Agent Configuration

This section explains how to execute the BMULTI Agent Configurator using the default configuration file or creating a new one. It also describes how to add, delete, modify, or display station information.

The BMULTI Agent Configuration File

You create a configuration file by running the BMULTI Agent Configurator before installing the BMULTI Agent. You can use the default file name, `[!Sys]<Sys>BmultiAgentConfig.Sys`, or enter a new or existing file name in the **Configuration File Name** parameter field in the command line. The default configuration file creates or modifies the BMULTI Agent configuration file on the CTOS server workstation or shared resource processor.

The Main Menu displays the name of the configuration file name being created or modified.

If you install more than one operating environment through the BMULTI Agent, create a separate configuration file for each operating environment. You will be able to call up an existing file for each specific operating environment when you install the BMULTI Agent.

Creating a New Configuration File

Use this procedure to create a new BMULTI Agent configuration file. If you are running the BMULTI Agent for the first time, you can use the default file name. If you plan to have multiple configurator files in the future, you should not use the default file name. Enter a specific file name for each configurator file.

1. Execute the BMULTI Agent Configurator, entering a new file name if you do not want to use the default file name,
[!Sys]<Sys>BmultiAgentConfig.Sys.

2. Press the F1 key (GENERAL) on the Main Menu to display the General Information screen.

When you create a new configuration file, you must enter values for the parameters on the General Information screen before defining the station names. To enter a number, delete or overtype any previous value if present, type the new value and press the RETURN, NEXT, or TAB key.

3. Enter a number from 3 to 6 in the **DCP Number** field.
4. Enter a number from 1 to 8 in the **Line Number** field.
5. Enter a number from 1 to 140 in the **Logical Station Number (LSN) Lower Limit** field.
6. Enter a number from 1 to 140 in the **Logical Station Number (LSN) Upper Range** field.

The difference between the lower and upper range of the logical station numbers plus one must be equal to or greater than the number of stations defined in the BMULTI configuration file.

7. Press the F10 key (HOME) to return to the Main Menu.
8. Press the F2 key (SELECT) on the Main Menu to display the Station Selection screen.

Because you are creating a new configuration file, no station names are listed on the screen.

9. Press the F1 key (ADD) to display the Station Definition screen.
10. Enter the station name in the **Station Name** field.

The station name can be a maximum of 17 characters. The first character must be alphabetic. The additional characters must be alphanumeric.

11. Enter a two-character non-blank value in the **Device Address** field.

12. If required, enter the Service ID in the **Service ID** field.

This value can be from one to twelve characters and must be enclosed in angle brackets.

13. Enter the network control character in the **Network Control Character** field.

The character must be a hexadecimal number. It must not be a data communication control number.

14. Press the F2 key (SELECT) to display the Station Selection screen.

Repeat steps 9 through 13 to add the stations required in your BMULTI environment.

or

Press the F10 key (HOME) to return to the Main Menu.

Modifying the General Information

Use the following procedure to modify the BMULTI Agent configuration file information entered through the General Information screen of the BMULTI Agent Configurator on a CTOS system:

1. Execute the BMULTI Agent Configurator. If necessary, enter the name of the file to be modified, otherwise the default file name will be selected.
2. Press the F1 key (GENERL) on the Main Menu to display the General Information screen.

The current values entered in the configuration file are displayed.

3. Enter the new values for each field to be changed.
4. Press the F10 key (HOME) to return to the Main Menu.

Modifying a Station Definition

Use the following procedure to modify the BMULTI Agent configuration file information entered through the Station Definition screen of the BMULTI Agent Configurator on a CTOS system:

1. Execute the BMULTI Agent Configurator. If necessary, enter the name of the file to be modified, otherwise the default file name is selected.
2. Press the F2 key (SELECT) on the Main Menu to display the Station Selection screen.

The names of the stations currently entered in the configuration file are displayed.

3. Select the name of the station to be modified. Press F2 (MODIFY) to display the Station Definition screen.

The values currently entered for that station name are displayed.

4. Enter the new values for the fields to be modified.
5. Press the F10 key (HOME) to return to the Main Menu.

Adding a Station

Use the following procedure to add a station to the BMULTI Agent configuration file information through the Station Definition screen of the BMULTI Agent Configurator on a CTOS system:

1. Execute the BMULTI Agent Configurator. If necessary, enter the name of the file to be modified, otherwise the default file name will be selected.
2. Press the F2 key (SELECT) on the Main Menu to display the Station Selection screen.

The names of the stations currently entered in the configuration file are displayed.

3. Press the F1 key (ADD) to display the Station Definition screen.

4. Enter the station name in the **Station Name** field.

The station name can be a maximum of 17 characters. The first character must be alphabetic. The additional characters must be alphanumeric.

5. Enter a two-character non-blank value in the **Device Address** field.

6. If required, enter the Service ID in the **Service ID** field. This value can be from one to twelve characters and must be enclosed in angle brackets.

7. Enter the network control character in the **Network Control Character** field.

The character must be a hexadecimal number. It must not be a data communication control number.

8. Press the F2 key (SELECT) to display the Station Selection screen.

To add additional stations, repeat steps 4 through 8.

or

Press the F10 key (HOME) to return to the Main Menu.

Deleting a Station

Use the following procedure to delete a station in the BMULTI Agent configuration file information through the Station Selection screen of the BMULTI Agent Configurator on a CTOS system:

1. Execute the BMULTI Agent Configurator.
2. Press the F2 key (SELECT) on the Main Menu to display the Station Selection screen.

The names of the stations currently entered in the configuration file are displayed.

3. Select the station to be deleted.
4. Press the F3 key (DELETE). A message to confirm the selection of the station to be deleted is displayed on the screen.

5. Press the GO key to delete the station. The Station Selection screen is redisplayed and the station is deleted.
6. Press the F10 key (HOME) to return to the Main Menu.

Displaying the Names of the Stations

Use the following procedure to display the stations in the BMULTI Agent configuration file information through the Station Selection screen of the BMULTI Agent Configurator on a CTOS system:

1. Execute the BMULTI Agent Configurator.
2. Press the F2 key (SELECT) on the Main Menu to display the Station Selection screen.

The names of the stations currently entered in the configuration file are displayed.

3. Press the F10 key (HOME) to return to the Main Menu.

Section 5

Installing the BMULTI Agent

This section explains how to install the agent on a CTOS workstation, IDS module, or shared resource processor as a system service.

Note: *The BMULTI Agent must be operating on the same processor as the BMULTI gateway.*

Before Installing the BMULTI Agent

Before you can install the BMULTI Agent as a system service, you must complete the following steps:

1. Define the BMULTI Agent as a control program using the network control definition module. The program you need to define is named *[!Sys]<Sys>BmultiAgent.Run*. See the *BTOS Message Control System (MCS) Implementation and Operations Guide* for more information.

2. Install the Message Control System (MCS) software on the CTOS workstation, IDS module, or shared resource processor.

Within the MCS, the communication organizer and the message control module are required. The operator interface module is optional.

3. Install the BMULTI Gateway software on the CTOS system. Remember that the BMULTI Gateway and Agent software must reside on the same processor.

See the *CTOS BMULTI Operations and Programming Guide* for more information about the BMULTI communications service.

4. Define the environment using the BMULTI Agent Configurator.

See Section 3, "Using the BMULTI Agent Configurator," and Section 4, "Modifying the BMULTI Agent Configuration," in this guide for information about configuring the agent.

Installing the BMULTI Agent

Manual Installation on a CTOS Workstation

1. Once you fulfill the requirements for installing the agent, at the Executive Command line, type *Install BMULTI Agent* and press the RETURN key. The following form is displayed:

```
Install BMULTI Agent
[Configuration file name]
[Detach on Tx Error (Default = Y)]
[Tx Timeout in Secs (Default = 120)]
```

2. The default BMULTI Agent configuration file name is *[!Sys]<Sys>BmultiAgentConfig.Sys*. If this is not the name of your configuration file, type the name of your configuration file.
3. The optional parameter, **[Detach on Tx Error (Default = Y)]**, specifies that if there is a transmission error associated with the BMULTI gateway, the Logical Station connection is to be detached. The alternate selection specifies that the connection is to be maintained, even if there is a transmit error.
4. The next optional parameter, **[Tx Timeout in Secs (Default = 120)]**, defines the maximum time that can elapse when waiting to transmit. The value can be any integer value from 0 to 65536, with 0 denoting no timeout value.
5. When you are finished entering the information, press the GO key.

Manual Installation on the IDS Module

As an alternative to loading the BMULTI Agent on the CPU of a CTOS workstation, you can instead load it on an IDS or enhanced IDS module attached to the workstation. When running on the IDS module, the CPU processor overhead for the agent is considerably lower than when running on the CPU module.

Note: *To install the BMULTI Agent on the IDS or enhanced IDS module, you must have the module attached to the CTOS workstation, and IDMSS software installed on it.*

Once you have fulfilled the prerequisites for installing the BMULTI Agent, you can install it on the IDS module, that is, load it onto the module as a system service.

1. Type *IMRun* and press the RETURN key.
2. Enter the information in the form that appears

```
IMRun
Processor ID #
Run File      [Sys]<Sys>BmultiAgent.Run
[Case]
[Command]
[Parameter 1] ConfigurationFile
[Parameter 2] DetachOnTxError
[Parameter 3] TxTimeout
(etc...)
```

The value # is the processor ID number of the IDS module, and *[Sys]<Sys>BmAgent.Run* is the name of the BMULTI Agent system service run file.

If you do not enter values in the optional fields, the Agent will use the default values: Configuration file *[!Sys]<Sys>BmultiConfig.Sys*, detach on transmit errors, and 120 seconds transmit timeout.

When you are finished entering the information, press the GO key.

Automatic Installation on a CTOS Workstation at Bootup

To set up the BMULTI Agent on a CTOS workstation so that it is available at bootup, edit the file *[Sys]<Sys>SysInit.Jcl*, a version of the file included with the MCS software package.

The contents of the MCS supplied JCL file are:

```
$JOB SYSINIT
$RUN [Sys]<Sys>CO.Run
$RUN [Sys]<Sys>MCM.Run
$RUN [Sys]<Sys>OIManager.Run,,1000
;
; If you want to run a gateway, an agent, and a DCP on a
; main CPU, then include the next three lines in the
; following order.

$RUN [Sys]<Sys>( Insert Gateway here )
$RUN [Sys]<Sys>( Insert Agent here )
$RUN [Sys]<Sys>( Insert DCP here )
;
; The next line is an example for DCP.

; RUN [Sys]<Sys>DCP.Run, (LineTableName,Channel)
;
; If you want to run a gateway, an agent, and a DCP on
; an IDS, then include the next five lines in the
; following order.

$IMRUN [Sys]<Sys>(Insert Gateway here)
$RUN [Sys]<Sys>DisableTerminate.Run
$IMRUN [Sys]<Sys>(Insert Agent here)
$IMRUN [Sys]<Sys>(Insert DCP here)
$RUN [Sys]<Sys>EnableTerminate.Run
;
$END
```

Using the CTOS Editor utility, make the following modifications to the *SysInit.jcl* file:

1. Type the name of the gateway run file in the following instruction:

```
$RUN [Sys]<Sys>( Insert Gateway here )
```

The run file for the BMULTI gateway is *[Sys]<Sys>BmZip.Run*.

See the *CTOS BMULTI Operations and Programming Guide* for more information about BMULTI gateway configuration and parameters.

2. For installation on a workstation, type the name of the agent run file in the following instruction:

```
$RUN [Sys]<Sys>( Insert Agent here )
```

For BMULTI gateway communications, the agent is the BMULTI Agent.

The default run file and parameters for the BMULTI Agent are:

```
[!Sys]<Sys>BMULTIAgent.Run,[!Sys]<Sys>BMULTIAgentConfig.Sys,Y,120
```

If you want, you can use a different configuration file name, detach on transmit error selection, and transmit timeout value.

3. If you want to install a DCP, type the name of the DCP run file in the following instruction:

```
$RUN [Sys]<Sys>( Insert DCP here )
```

Otherwise, replace the dollar sign preceding RUN with a semicolon, turning the line into a comment.

4. Overtyping the dollar sign that precedes the IMRUN and RUN statements with a semicolon in the following five instructions:

```
$IMRUN [Sys]<Sys>(Insert Gateway here)
$RUN [Sys]<Sys>DisableTerminate.Run
$IMRUN [Sys]<Sys>(Insert Agent here)
$IMRUN [Sys]<Sys>(Insert DCP here)
$RUN [Sys]<Sys>EnableTerminate.Run
```

This changes the statements from executable instructions into comments.

5. Do *not* modify the \$END statement.

After you modify the SysInit.JCL file, it should resemble the following sample. The lines in the file that were modified are indicated in bold.

```
$JOB SYSINIT
$RUN [Sys]<Sys>CO.Run
$RUN [Sys]<Sys>MCM.Run
$RUN [Sys]<Sys>OIManager.Run,,1000
;
; If you want to run a gateway, an agent, and a DCP on a
; main CPU, then include the next three lines in the
; following order.

$RUN [Sys]<Sys>BmZip.Sys.Run
$RUN [Sys]<Sys>BmultiAgent.Run,[!Sys]<Sys>BmultiAgentConfig.Sys,Y,120
;RUN [Sys]<Sys>( Insert DCP here )
;
; The next line is an example for DCP.
; RUN [Sys]<Sys>DCP.Run,(LineTableName,Channel)
;
; If you want to run a gateway, an agent, and a DCP on
; an IDS, then include the next five lines in the
; following order.

;IMRUN [Sys]<Sys>(Insert Gateway here )
;RUN [Sys]<Sys>DisableTerminate.Run
;IMRUN [Sys]<Sys>(Insert Agent here)
;IMRUN [Sys]<Sys>(Insert DCP here)
;RUN [Sys]<Sys>EnableTerminate.Run
;
$END
```

Automatic Installation on an IDS Module at Bootup

To set up the BMULTI Agent on an IDS or enhanced IDS module so that it is available at bootup, edit the file `[Sys]<Sys>SysInit.Jcl`, the version included with the MCS software package.

The contents of the supplied JCL file are:

```
$JOB SYSINIT
$RUN [Sys]<Sys>CO.Run
$RUN [Sys]<Sys>MCM.Run
$RUN [Sys]<Sys>OIManager.Run,,1000
;
; If you want to run a gateway, an agent, and a DCP on a
; main CPU, then include the next three lines in the
; following order.

$RUN [Sys]<Sys>( Insert Gateway here )
$RUN [Sys]<Sys>( Insert Agent here )
$RUN [Sys]<Sys>( Insert DCP here )
;
; The next line is an example for DCP.

; RUN [Sys]<Sys>DCP.Run, (LineTableName,Channel)
;
; If you want to run a gateway, an agent, and a DCP on
; an IDS, then include the next five lines in the
; following order.

$IMRUN [Sys]<Sys>(Insert Gateway here)
$RUN [Sys]<Sys>DisableTerminate.Run
$IMRUN [Sys]<Sys>(Insert Agent here)
$IMRUN [Sys]<Sys>(Insert DCP here)
$RUN [Sys]<Sys>EnableTerminate.Run
;
$END
```


Using the CTOS Editor utility, make the following modifications to the SysInit.jcl file:

1. Type the name of the gateway run file in the following instruction:

```
$IMRUN [Sys]<Sys>( Insert Gateway here )
```

The run file for the BMULTI gateway is *[Sys]<Sys>BmZip.Run*.

Remember to include the IDS processor ID and a comma before the run file name. See the *CTOS BMULTI Operations and Programming Guide* for more information.

2. Type the name of the agent run file in the following instruction:

```
$IMRUN [Sys]<Sys>( Insert Agent here )
```

For BMULTI gateway communications, the agent is the BMULTI Agent.

The default run file for the BMULTI Agent is:

```
[/Sys]<Sys>BMULTIAgent.Run,,,,[/Sys]<Sys>BMULTIAgentConfig.Sys,Y,120
```

You should also enter the processor ID number of the IDS module, followed by a comma, *before* the run file. You can use a different configuration file name, detach on transmit error selection, or transmit timeout values.

3. If you want to install a DCP, type the name of the DCP run file in the following instruction:

```
$IMRUN [Sys]<Sys>( Insert DCP here )
```

Include the processor ID, as previously explained. otherwise, replace the dollar sign preceding RUN with a semicolon, turning the line into a comment.

4. Overtyping the dollar sign that precedes the RUN statement with a semicolon in the following three instructions:

```
$RUN [Sys]<Sys>( Insert Gateway here )  
$RUN [Sys]<Sys>( Insert Agent here )  
$RUN [Sys]<Sys>( Insert DCP here )
```

This changes the statements from executable instructions into comments.

5. Do *not* modify the \$END statement.

After you have modified the SysInit.JCL file, it should resemble the following sample. The lines in the file that were modified are indicated in bold.

```
$JOB SYSINIT
$RUN [Sys]<Sys>CO.Run
$RUN [Sys]<Sys>MCM.Run
$RUN [Sys]<Sys>OIManager.Run,,1000
;
; If you want to run a gateway, an agent, and a DCP on a
; main CPU, then include the next three lines in the
; following order.

;RUN [Sys]<Sys>(Insert Gateway here )
;RUN [Sys]<Sys>( Insert DCP here )
;RUN [Sys]<Sys>(Insert Agent here)

; The next line is an example for DCP.
; RUN [Sys]<Sys>DCP.Run, (LineTableName,Channel)
;
; If you want to run a gateway, an agent, and a DCP on
; an IDS, then include the next five lines in the
; following order.

$IMRUN 1,[Sys]<Sys>BmZip.Sys.Run
$RUN [Sys]<Sys>DisableTerminate.Run
$IMRUN 1,[Sys]<Sys>BmultiAgent.Run,,, [Sys]<Sys>BmultiAgentConfig.Sys,Y,120
;IMRUN [Sys]<Sys>(Insert DCP here)
$RUN [Sys]<Sys>EnableTerminate.Run
;
$END
```

Automatic Installation on a Shared Resource Processor at Bootup

To set up the BMULTI Agent on a shared resource processor so that it is available at bootup, edit the file `[Sys]<Sys>SysInit.Jcl`, the version included with the MCS software package.

On the XE520, this file is either `[Sys]<Sys>InitCPxx.Jcl` or `[Sys]<Sys>InitTPxx.Jcl` for cluster and terminal processor boards, respectively. The number `xx` represents the board number on your system.

On the XE-530, this file is called `[Sys]<Sys>SRPSysInit.Jcl`. This file is divided into sections, one for each of the cluster or terminal processor boards used.

Note: *There is no manual method of installing the BMULTI Agent system service on a shared resource processor. You must edit the appropriate JCL file and reboot the system. Similarly, to remove the agent as a system service, you must delete the BMULTI Agent entries in the JCL file and reboot the system.*

The contents of the supplied `InitFP00.JCL` are:

InitFP00.JCL

```
$JOB InitFP00
$CONTINUEONERROR
$RUN [!Sys]<Sys>CO.Run
$RUN [!Sys]<Sys>MCM.Run
$RUN [!Sys]<Sys>OIManager.Run, ,1000
$RUN [!Sys]<Sys>MfAdminAgent.Run
$END
```

When the `InitFP00.JCL` file is executed, the MCS is installed. Within the MCS, the communication organizer and the message control module are required. The Operator Interface (OI) module is optional. See the *BTOS Message Control System (MCS) Implementation and Operations Guide* for more information about the OI module.

The contents of the supplied cluster processor files are:

InitCP00.JCL

```
$CONTINUEONERROR
$RUN DCPWait.Run,100
$RUN [!Sys]<Sys>( Insert Gateway here )
$RUN [!Sys]<Sys>( Insert Agent here )
$RUN [!Sys]<Sys>( Insert DCP here )
;
; The next line is an example for DCP.
; RUN [!Sys]<Sys>DCP.Run, (LineTableName,Channel)
;
$END
```

InitCP01.JCL

```
$CONTINUEONERROR
$RUN DCPWait.Run,200
$RUN [!Sys]<Sys>( Insert Gateway here )
$RUN [!Sys]<Sys>( Insert Agent here )
$RUN [!Sys]<Sys>( Insert DCP here )
;
; The next line is an example for DCP.
; RUN [!Sys]<Sys>DCP.Run, (LineTableName,Channel)
;
$END
```

Use the following procedure to install the BMULTI Agent on a shared resource processor:

1. Type the name of the gateway run file in the following instruction for each cluster processor on which you want to install the gateway:

```
$RUN [!Sys]<Sys>( Insert Gateway here )
```

The file name for the BMULTI gateway is *[Sys]<Sys>BmZip.Run*

See the *CTOS BMULTI Operations and Programming Guide* for more information about the BMULTI gateway.

2. Type the name of the agent run file in the following instruction for each cluster processor on which you want to install the agent:

```
$RUN [!Sys]<Sys>( Insert Agent here )
```

The default run file for the BMULTI Agent is

[Sys]<Sys>BmultiAgent.Run,[Sys]<Sys>BmultiAgentConfig.Sys,Y,120

If you want, you can use a different configuration file name, detach on transmit error selection, and transmit timeout value. To use the agent, however, you must install it on the same processor as the BMULTI gateway.

3. If you want to install a DCP, type the name of the DCP run file in the following instruction:

```
$RUN [Sys]<Sys>( Insert DCP here )
```

Otherwise, replace the dollar sign preceding RUN with a semicolon, turning the line into a comment.

4. Do *not* modify the \$END statements.

The following are samples of modified JCL files. The sample files install the MCS on the first terminal processor. A single copy of the BMULTI Agent is installed on the first cluster processor, but not on the second cluster processor, with no DCP. The lines that were modified in each file are indicated in bold.

InitFP00.JCL

```
$JOB InitFP00
$CONTINUEONERROR
$RUN [!Sys]<Sys>CO.Run
$RUN [!Sys]<Sys>MCM.Run
$RUN [!Sys]<Sys>OIManager.Run, , 1000
$RUN [!Sys]<Sys>MfAdminAgent.Run
$END
```

InitCP00.JCL

```
$CONTINUEONERROR
$RUN DCPWait.Run, 100
$RUN [!Sys]<Sys>BmZip.Run
$RUN [!Sys]<Sys>BmultiAgent.Run, [!Sys]<Sys>BmultiAgentConfig.Sys, Y, 120
; RUN [!Sys]<Sys>( Insert DCP here )
;
; The next line is an example for DCP.
; $RUN [!Sys]<Sys>DCP.Run, (LineTableName, Channel)
;
$END
```

InitCP01.JCL

```
$CONTINUEONERROR
;RUN DCPWait.Run,200
;RUN [!Sys]<Sys>( Insert Gateway here )
;RUN [!Sys]<Sys>( Insert Agent here )
;RUN [!Sys]<Sys>( Insert DCP here )
;
; The next line is an example for DCP.
; RUN [!Sys]<Sys>DCP.Run, (LineTableName,Channel)
;
$END
```

Executing the JCL File

Reboot the CTOS workstation or shared resource processor to execute the modified JCL file.

When the JCL file is executed, the MCS, BMULTI gateway, and BMULTI Agent are installed. If you encounter an error, refer to the documentation for the component that reported the problem or failed to install.

Verifying the Installation

Once you have installed the BMULTI Agent, use the Operator Interface (OI) module of the MCS to verify that the environment is working properly. To verify the operation of the BMULTI gateway, use the BMULTI status monitor.

The OI module verifies the version of the BMULTI Agent and the status of the line. See the *BTOS Message Control System (MCS) Implementation and Operations Guide* for more information.

Deinstalling the BMULTI Agent

If you installed the agent using the Software Installation command, you can deinstall the agent only by rebooting the CTOS system on which it resides.

If the BMULTI Agent is no longer required on a system, and you customized the JCL installation process, use the CTOS Editor to delete the agent run file from the system's SysInit.JCL file before rebooting the workstation or shared resource processor.

If you remove the BMULTI gateway system service, you must also remove the BMULTI Agent.

Appendix A

System Messages and Status Codes

This section lists the system messages that may be displayed when you use the BMULTI Agent and the BMULTI Agent Configurator. It is divided into three parts: The first part describes the agent's response to network errors that *may* occur between the BMULTI Agent and the MCS or the BMULTI gateway; the second part describes the BMULTI Agent Configurator error messages; the third part describes the BMULTI Agent error messages. The latter parts also explain how to respond to these messages. The messages are listed in numerical order.

BMULTI Agent Network Messages

When the agent encounters an error when communicating with the communication organizer (CO), message control module (MCM), or BMULTI gateway, the agent activates the error executor. Using the error executor, the agent responds to CO and BMULTI gateway network errors.

Communication Organizer Errors

The agent terminates on any fatal CO error. These errors are logged in the CTOS log file.

Non-fatal CO errors are logged in the MCM error log file. If the Operator Interface module of the Message Control System (MCS) is installed, the non-fatal CO errors are displayed. See the *BTOS Message Control System (MCS) Installation and Operations Guide*.

BMULTI Gateway Errors

If the agent encounters errors while attempting to communicate with the BMULTI gateway, the agent lists these errors in the MCM error log file. Because these errors are generated by actions from the host, contact the host's system administrator.

If the Operator Interface module of the MCS is installed, the following errors are displayed (for more information, see the *BTOS Message Control System (MCS) Installation and Operations Guide*).

Error Number	Error Condition and Agent Action
44657	<i>Retryable NAK response from the BMULTI Agent.</i> The message indicates a negative response to a selection or transmission. Retry the action. If unsuccessful, contact the host's system administrator.
44658	<i>UnRetryable NAK response from the BMULTI Agent.</i> Contact host's system administrator.
44659	<i>Host Not Ready.</i> Contact host's system administrator.
44660	<i>Transmit Error.</i> Contact host's system administrator.
44661	<i>Receive Error.</i> Contact host's system administrator.
44662	<i>Receive Ready Error.</i> Contact host's system administrator.

The application program executing in the poll/select environment and interfacing with the MCS will check the DCPToggle field *only* when receiving messages from the host. If the value returned in this field is 1, it indicates a duplicate message sent from the host. If the value returned in this field is 2, it indicates a sequence number error detected by the agent.

BMULTI Agent Configurator Messages

If the agent configuration file cannot be successfully installed or if you attempt to fill in the configurator screens incorrectly, the system beeps and displays one of the following messages at the bottom of the screen.

Refer to the appropriate section in this guide for assistance in correcting the error conditions generated during the installation of the configurator. Errors that may occur during the installation of the configurator are numbered 44600 through 44605.

If you encounter an error condition while using the configurator screens, you must press the CANCEL key before you can operate the agent configurator again. Errors that may occur while entering data on the configurator screens are numbered 44611 through 44630.

Error Number	Error Message and Required Action
44600	<i>Incorrect Configuration file name specification.</i> The name you assigned to the configuration file does not match the file name in the processor's JCL file.
44601	<i>Configuration file name cannot exceed 50 characters.</i> Rename the configuration file. Verify that the new name matches that in the processor's JCL file.
44602	<i>Configuration file is corrupted.</i> Delete and recreate the configuration file.
44603	<i>INTERNAL INCONSISTENCY.</i> Report to System administrator.
44604	<i>INTERNAL INCONSISTENCY.</i> Report to System Administrator.
44605	<i>Form library file does not exist.</i> Recopy product disk. Refer to Section 2 and the <i>CTOS BMULTI Operations and Programming Guide</i> .
44611	<i>DCP number is required.</i> Press <CANCEL> to continue. Enter a number between three and six in the DCP Number field.
44612	<i>DCP number must be from 3 to 6.</i> Press <CANCEL> to continue. Enter a number between three and six in the DCP Number field.

System Messages and Status Codes

Error Number	Error Message and Required Action
44613	<i>Line number is required. Press <CANCEL> to continue. Enter a number between one and eight in the Line Number field.</i>
44614	<i>Line number should be from 1 to 8. Press <CANCEL> to continue. Enter a number between one and eight in the Line Number field.</i>
44615	<i>Lower LSN limit is required. Press <CANCEL> to continue. Enter a number between 1 and 255 in the LSN Lower Limit field.</i>
44616	<i>Upper LSN limit is required. Press <CANCEL> to continue. Enter a number between 1 and 255 in the LSN Upper Limit field.</i>
44617	<i>Upper limit cannot be less than lower. Press <CANCEL> to continue. Either enter a number in the LSN Upper Limit field that is greater than or equal to the number in the LSN Lower Limit field, or enter a number in the LSN Lower Limit field that is less than or equal to the number in the LSN Upper Limit field.</i>
44618	<i>Must enter number from 1 to 255. Press <CANCEL> to continue. Enter a number between 1 and 255 in both LSN Lower Limit and LSN Upper Limit fields.</i>
44619	<i>Must enter numeric value. Press any key to continue. Enter a number between 1 and 255 in both LSN Lower Limit and LSN Upper Limit fields.</i>
44620	<i>Station name should be alphanumeric. Press <CANCEL> to continue. The first character of the station name must be alphabetic. The remaining characters must be alphanumeric.</i>
44621	<i>Must increase LSN range to add stations. Press <CANCEL> to continue. All logical station numbers are assigned. Expand the range between the lower and upper limits on the General Information screen if you wish to add stations.</i>
44622	<i>Station name is required. Press <CANCEL> to continue. You must define the station name to which you will assign the device address.</i>
44623	<i>First character must be alphabetic. Press <CANCEL> to continue. The first character of a station name must be alphabetic. The remaining characters must be alphanumeric.</i>
44624	<i>Station already exists. Press <CANCEL> to continue. A station with this name was already defined. Enter a different station name.</i>

Error Number	Error Message and Required Action
44625	<i>Device address already defined. Press <CANCEL> to continue.</i> A device with this address was already defined. Enter a different two-character value.
44626	<i>Control character must be hexadecimal. Press <CANCEL> to continue.</i> Enter a hexadecimal value in the <i>Network Control Character</i> field that has not been previously assigned as a protocol control character, CRT message formatting character, or printer message formatting character.
44627	<i>Illegal character in device address.</i> The value entered in the field is assigned to another BMULTI Agent function or allotted another meaning in the system. Enter another value for the device address.
44628	<i>Incorrect station name. Press <CANCEL> to continue.</i> The station name must not contain a blank character. The first character must be alphabetic. The remaining characters must be alphanumeric.
44629	<i>Range not appropriate. Press <CANCEL> to continue.</i> The number entered for the upper LSN range is lower than the range required for the number of stations defined.

BMULTI Agent Installation Error Messages

If the agent cannot be successfully installed, the system beeps and displays one of the following messages at the bottom of the screen.

Error Number	Error Message and Required Action
44650	<i>Configuration file is corrupted. It has to be recreated. You must create a new BMULTI Agent configuration file.</i>
44651	<i>CO is not installed. The MCS Communications Organizer module is not installed.</i>
44652	<i>MCM is not installed or no free subqueue is available. The MCS Message Control Module is not installed or does not have the resources to handle the BMULTI Agent request.</i>
44653	<i>BMULTI gateway is not installed. BMULTI Agent cannot operate without the BMULTI gateway. Make sure it is configured and installed correctly before attempting to install or use the BMULTI Agent.</i>
44654	<i>No stations defined in the configuration file. BMULTI Agent requires that at least one station be defined in the agent configuration file to operate.</i>
44655	<i>DCP number, Line number and LSN range are not defined. These parameters in the BMULTI Agent configuration file must be defined to use the agent.</i>
44656	<i>MCM-DCP initialization error. There has been an error in the initialization of the MCS Message Control Module and the DCP.</i>

Appendix B

Worksheet

This section contains a blank worksheet that you can use to plan or record your BMULTI Agent configuration.

For descriptions of the BMULTI Agent parameters listed on the worksheet, see Section 3 of this guide.

Do not write on the worksheet provided in this section. Use it to make photocopies on which to work.

After you have finished planning your agent environment, enter the final parameters on a clean worksheet that can kept for later reference. Be sure that you kept a separate worksheet describing each configuration file you create.

BMULTI Agent Configuration File Worksheet

Configuration File Name: _____

DCP Number (3-6) _____

Line Number (1-8) _____

LSN Lower Limit (1-140) _____

LSN Upper Limit (1-140) _____

Station Name	Device Address	Network Control Char	Service ID
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
14. _____	_____	_____	_____
15. _____	_____	_____	_____
16. _____	_____	_____	_____

continued

Continued

Station Name	Device Address	Network Control Char	Service ID
17. _____	_____	_____	_____
18. _____	_____	_____	_____
19. _____	_____	_____	_____
20. _____	_____	_____	_____
21. _____	_____	_____	_____
22. _____	_____	_____	_____
23. _____	_____	_____	_____
24. _____	_____	_____	_____
25. _____	_____	_____	_____
26. _____	_____	_____	_____
27. _____	_____	_____	_____
28. _____	_____	_____	_____
29. _____	_____	_____	_____
30. _____	_____	_____	_____
31. _____	_____	_____	_____
32. _____	_____	_____	_____

Glossary

A

ASCII

The American Standard Code for Information Interchange, which defines the character set codes used for information transfer between equipment.

agent

A software service that provides an interface between the Message Control System and a specified protocol handler in a communication network.

B

BMULTI Agent

A software module that provides an asynchronous message-level interface between the BTOS MCS Message Control System and the BMULTI protocol handler. The BMULTI Agent has two components—the BMULTI Agent system service and the BMULTI Agent Configurator.

BMULTI Agent Configurator.

(1) A component of the BMULTI Agent. (2) The menu-driven utility that allows you to define the configuration file required by the agent.

C

CO

See Communications Organizer.

Communications Organizer (CO) module

(1) A component of the Message Control System. (2) A software module that controls the flow of messages transmitted from station/program to station/program, queueing messages entering the system and transferring the messages to the message control module. (3) A system service that runs the secondary application partition of the server processor.

configuration file

The file created by the BMULTI Agent Configurator that defines the network configuration parameters required by the agent.

D

Data Communications Processor (DCP)

A software module that provides the protocols for the network's downstream data communications from the master processor to the RS232C devices.

DCP

See Data Communications Processor.

device address

A unique two character non-blank value that defines the device address associated with a station name in the BMULTI Agent configuration file.

G

General Information screen

The screen displayed by the BMULTI Agent Configurator on which you define the DCP number, the line number, the LSN lower limit, and the LSN upper limit. This information is saved in the configuration file.

H

host

A mainframe computer that provides data communications, data storage, data manipulation, and application program support for the network.

I

IDMSS

Intelligent Data Communications Module Systems software.

IDS

A coprocessor, attached to a CTOS workstation, that specializes in the execution of data communication software. The IDS is controlled by the Intelligent Data Communications Module Systems software. There are two types of IDS available, the IDS (B25-IDS) and the enhanced IDS (B25-ID2).

Interactive Table Processor

(1) A component of the poll/select terminal interface software. (2) An interactive software module that you can use to define network tables and generate DCPs. The tables are stored in the source network information file.

L**line**

An RS232C connection between a CTOS processor and RS232C devices.

line number

The unique number that defines the line in the BMULTI Agent configuration file.

Logical Station Number (LSN)

The unique number assigned to each station in the network in the BMULTI Agent configuration file.

LSN

See Logical Station Number.

M**Main Menu**

The first screen displayed by the BMULTI Agent Configurator on which you define the name of the configuration file you want to access.

MCS

See Message Control System.

Message Control Module (MCM)

(1) A component of the Message Control System. (2) A software module that routes messages within the network, monitors system status, optionally archives messages, and provides an interface to the data communications processor(s). (3) A system service that runs in the secondary application partition of the master processor.

Message Control System (MCS)

A data communications system that receives and routes messages to various destinations in the network. The Message Control System consists of four modules: the communications organizer module, the message control module, the operator interface module, and the network control definition module.

N

NCC

See Network Control Command.

NCD module

See Network Control Definition module.

Network control character

The hexadecimal value defined in the BMULTI Agent configuration file that specifies which network control commands will be recognized as a command by the agent.

Network control command

A command that allows application programs and stations to control the data communications environment.

Network Control Definition (NCD) module.

(1) A component of the Message Control System. (2) An interactive software module that is used to customize the network by defining the characteristics of the message control module.

O

OI

See Operator Interface module.

Operator Interface module (OI)

(1) A component of the Message Control System. (2) A software module that is used to send messages and network control commands to the message control module from a CTOS workstation or shared resource processor. The operator interface module has two components: the operator interface client and the operator interface manager.

S

Service ID

The name assigned to one of several possible copies of BMULTI when running under the Multiple Gateway Server (MGS).

shared resource processor

A CTOS XE-530 or XE520 processor system running either the XEBTOS or CTOS/XE operating system.

station

A logical representation, defined in the software, of a specific RS232C device or application program.

Station Definition screen

The screen displayed by the BMULTI Agent Configurator on which you add, modify, and save station information such as the station name, device address, ServiceID, and network control character.

station name

The unique name of a station in the network defined in the BMULTI Agent configuration file.

Station Selection screen

The screen displayed by the BMULTI Agent Configurator that lists all the station names defined in the configuration file.

system service

Software that is loaded into the RAM memory of a CTOS workstation, IDS module, or shared resource processor. Once loaded, it handles requests for its whatever services it can provide. The BMULTI Agent, when configured and loaded into RAM, is a system service.

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